

CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

1-11. (Canceled)

12. (Previously presented) The method according to claim 25, wherein the step of analyzing the output waveform includes utilizing chronocoulometry.

13. (Previously presented) The method according to claim 25, wherein the step of analyzing the output waveform includes applying the output waveform to a digital lock-in amplifier.

14. (Withdrawn) The method according to claim 25, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes fitting the output waveform to the characteristic waveform.

15. (Withdrawn) The method according to claim 14, wherein the step of fitting the output waveform to the characteristic waveform includes calculating an error between the characteristic waveform and the output waveform.

16. (Withdrawn) The method according to claim 25, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes determining a background signal and subtracting the background signal from the output waveform.

17. (Previously presented) The method according to claim 25 wherein the electron transfer moiety comprises a transition metal complex.

18. (Previously presented) The method according to claim 25 wherein the target analyte comprises a nucleic acid.

19. (Withdrawn) The method according to claim 25 wherein the target analyte comprises a protein.

20. (Previously presented) The method according to claim 25 wherein the input waveform comprises at least a portion having a frequency of about 100 kHz.

21. (Previously presented) The method according to claim 25 wherein the input waveform is a voltage waveform and the output waveform is a current waveform.
22. (Previously presented) The method according to claim 25 wherein the output waveform comprises a Gaussian waveform.
23. (Previously presented) The method according to claim 25 wherein the output waveform comprises a modified Gaussian waveform.
24. (Previously presented) The method according to claim 25 further comprising predicting the output waveform, based at least on the electron transfer moiety.
25. (Previously presented) A method for detecting the presence of a target analyte, the method comprising:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety (ETM) that is responsive to an input waveform;
applying the input waveform to the electrode to generate an output waveform; and
analyzing the output waveform using peak recognition as an indication of the presence of said target analyte.
26. (Currently amended) The method of claim 25 comprising detecting a plurality of different ETMS ETMs each having different potentials as a measure of the presence of a plurality of different target analytes, wherein at least one of the plurality of different ETMs comprises a transition metal complex.
27. (New) The method of claim 26 wherein the transition metal complex comprises a metallocene.
28. (New) The method of claim 27 wherein the metallocene comprises a ferrocene.